

REMARKS

This Amendment responds to the Office Action dated September 25, 2006 in which the Examiner rejected claims 1-3, 5-16 and 18-24.

As indicate above, claims 1, 9 and 16 have been amended in order to make explicit what is implicit in the claim. The amendment is unrelated to a statutory requirement for patentability.

Claim 1 claims a stator core, claim 9 claims a core back and claim 16 claims a method for producing a stator core. The stator core comprises a core back and a plurality of teeth. The plurality of teeth are arranged circumferentially on the core back and extend radially therefrom. The core back is at least one sheet of electrically insulated soft magnetic material arranged as a spiral. The core back includes openings, each associated with a tooth. A portion of each tooth is inserted into an associated opening. Each end of the sheet includes an opening which is not encircled by the sheet. The openings at each end of the sheet are arranged at a same tooth.

Through the structure and method of the claimed invention having each end of the sheet electrically insulated soft magnetic material including an opening which is not encircled by the sheet and arranging the openings at each end of the sheet at a same tooth, as claimed in claims 1, 9 and 16, the claimed invention provides a stator core, core back and method of producing a stator core which improves the magnetic flux which will flow through each turn of the spiral core to a tooth. In addition by arranging the openings at the end of the sheet at a same tooth, the area of electrical insulated soft magnetic material acting as a flux path at one side of the

tooth is essentially the same as the area at the other side of the tooth. The prior art does not show, teach or suggest the invention as claimed in claims 1, 9 and 16.

Claims 1-3, 5-16 and 18-24 were rejected under 35 U.S.C. §103 as being unpatentable over *Rosenberry, Jr.* (U.S. Patent 4,392,073) in view of *Jack et al.* (U.S. Patent 6,472,792).

Rosenberry, Jr. appears to disclose an amorphous metal stator structure including concentric cylinders formed of spirally or helically wound ribbon that is arranged to facilitate the mounting of one of the stator cylindrical components within the other. (Column 1, lines 10-14). In FIGS. 1 and 2, the first cylinder 4 is formed of an edgewound helix of amorphous metal ribbon that is arranged with its adjacent turns stacked on one another to form the cylinder. (Column 5, line 65 to column 6, line 2). As shown in FIG. 2, the respective helical turns forming the first cylinder 4 lie in planes that are substantially perpendicular to the longitudinal axis of the cylinder. On the other hand, each of the turns of a second helically wound cylinder 5 of amorphous metal ribbon is conical in configuration, as best seen in FIG. 2 of the drawing. (Column 6, lines 18-24). To enable energizing windings to be supported in operating relationship on the stator 1, the second cylinder 5 is provided with a plurality of axially extending winding slots 6, 6A, 6B, etc. which may be formed therein in any suitable manner. For example, the slots may be cast directly into the amorphous metal ribbon forming the cylinder 5 at the time the ribbon is originally solidified. (Column 6, lines 38-45).

Thus, *Rosenberry, Jr.* merely discloses a core back formed of one sheet. Nothing in *Rosenberry, Jr.* shows, teaches or suggests a) openings at each end of the sheet or b) the openings at each end of the sheet are arranged at a same tooth

as claimed in claims 1, 9 and 16. Rather, *Rosenberry, Jr.* merely discloses a core back formed of one sheet.

Also, *Rosenberry, Jr.* merely discloses a) a first cylinder 4 formed of an edge wound helix of amorphous metal ribbon and b) a second cylinder 5 formed inside the cylinder 4 and provided with a plurality of axially extending winding slots 6, 6A, 6B, etc. Nothing in *Rosenberry, Jr.* shows, teaches or suggests a core back including openings, each associated with a tooth as claimed in claims 1, 9 and 16. Rather, *Rosenberry, Jr.* merely discloses cylinders 4 and 5 without any openings.

Additionally, *Rosenberry, Jr.* merely discloses a cylinder 5 having a plurality of axially extending winding slots 6, 6A, 6B, etc. Thus, nothing in *Rosenberry, Jr.* shows, teaches or suggests a portion of each tooth is inserted into an associated opening in a core back as claimed in claims 1, 9 and 16. Rather, *Rosenberry, Jr.* teaches away from the claimed invention since the cylinder 5 is provided with the axially extending winding slots.

Finally, *Rosenberry, Jr.* merely discloses each cylinder 4 and 5 is made of amorphous metal formed into metal ribbons. Nothing in *Rosenberry, Jr.* shows, teaches or suggests a core back is at least one sheet of electrically insulated soft magnetic material as claimed in claims 1, 9 and 16. Rather, *Rosenberry, Jr.* merely discloses winding a metal ribbon of amorphous metal.

Jack et al. appear to disclose a stator tooth 1 illustrated in FIGS. 1 and 3-6 has a stem 2 of constant cross-sectional area and a distal tip 3 of larger cross-sectional area than the stem 2. Preferably, the tooth 1 is made by compressing a soft magnetic powder material, such as Somaloy 500 made by Hoganas AB of Sweden. The stator tooth 1 has a proximal end portion 4 of the same cross-sectional area as

(or less cross-sectional area than) the stem 2. A stator core-back section 5 illustrated in FIGS. 1, 2, 5 and 6 is of conventional shape except for a radial through-hole 6 having the same cross-sectional area as the proximal end portion 4 of the tooth 1 in FIGS. 1 and 3-6. The core-back section 5 may be made of the same material as the tooth 1, the surface of the hole 6 as well as the dimensions thereof being such as to enable a close fit with the proximal end portion 4 of the tooth 1 (col. 2, lines 31-46). In assembling a single stator section, the coil 7 is first slid on to the stem 2 of the tooth 1 from the proximal end portion 4 towards the distal tip 3. In order that this should be possible without any substantial gap existing between the coil 7 and the tooth 1 in the assembled state, stem 2 should have non-decreasing cross-sectional dimensions, i.e. substantially constant or increasing cross-sectional dimensions, from the proximal end portion 4 to the distal tip 3, i.e. along a length of the tooth corresponding to a winding slot. Also, the shape of the central hole of the coil 7 should correspond to the shape of the stem 2 (col. 2, lines 55-65).

Thus, *Jack et al.* merely discloses separate core back sections in which each opening is associated with a tooth. Nothing in *Jack et al.* shows, teaches or suggests a) openings at each end of a sheet which is not encircled by the sheet and b) the openings at each end of the sheet are arranged at a same tooth as claimed in claims 1, 9 and 16. Rather, *Jack et al.* only discloses separate core back sections.

Also, *Jack et al.* merely discloses assembling nine stator sections to form a complete stator core (column 2, lines 50-54). Nothing in *Jack et al.* shows, teaches or suggests a core back of at least one sheet of electrically insulated soft magnetic material arranged in a spiral as claimed in claims 1, 9 and 16. Rather, *Jack et al.*

teaches away from the claimed invention and forms the stator core from a plurality of sections.

Additionally, *Jack et al.* merely discloses force fitting a tooth 1 into a stator core back section 5. Nothing in *Jack et al.* shows, teaches or suggests inserting a portion of a tooth into an associated opening in the spirally wound core back as claimed in claims 1, 9 and 16. Rather, *Jack et al.* merely discloses teeth that are force fitted into one section of a core back.

Since neither *Rosenberry, Jr.* and *Jack et al.* shows, teaches or suggests a) each end of a sheet of electrically insulated soft magnetic material includes an opening which is not encircled by the sheet and b) the openings at each end of the sheet are arranged at a same tooth as claimed in claims 1, 9 and 16, applicant respectfully requests the Examiner withdraws the rejection to claims 1, 9 and 16 under 35 U.S.C. §103.

Claims 2-3, 5-8, 10-15 and 18-24 depend from claims 1, 9 and 16 and recited additional features. Applicant respectfully submits that claims 2-3, 5-8, 10-15 and 18-24 would not have been obvious within the meaning of 35 U.S.C. §103 over *Rosenberry, Jr.* and *Jack et al.* at least for the reasons as set forth above.

Therefore, Applicant respectfully requests the Examiner withdraws the rejection to claims 2-3, 5-8, 10-15 and 18-24 under 35 U.S.C. §103.

Thus it now appears that the application is in condition for reconsideration and allowance. Reconsideration and allowance at an early date are respectfully requested. Should the Examiner find that the application is not now in condition for allowance, applicant respectfully requests the Examiner enters this Amendment for purposes of appeal.

If for any reason the Examiner feels that the application is not now in condition for allowance, the Examiner is respectfully requested to contact, by telephone, the Applicant's undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed within the currently set shortened statutory period, Applicant respectfully petitions for an appropriate extension of time. The fees for such extension of time may be charged to our Deposit Account No. 02-4800.


In the event that any additional fees are due with this paper, please charge our Deposit Account No. 02-4800.

Respectfully submitted,

BUCHANAN INGERSOLL & ROONEY PC

Date: January 25, 2007

By:



Ellen Marcie Emas
Registration No. 32131

P.O. Box 1404
Alexandria, VA 22313-1404
703.836.6620